

Demographic change

Name

Worksheet 2

- 1) In the following table you will see how the four influencing factors^[1] develop in accordance with the SFSO's reference scenario. Enter these values into the Excel simulation. (Note: enter the time horizon 2050 into the user instructions).

Period	2016-2020	2021-2025	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050
Ø* number of children per woman	1.52	1.55	1.55	1.6	1.6	1.6	1,6
Ø male life expectancy	81.5	83.0	84.0	85.0	85.5	86.5	87,0
Ø female life expectancy	85.3	86.0	87.0	87.5	88.0	89.0	89,5
Ø annual net migration	50,799	50,000	55,000	50,000	40,000	35,000	35 000

*Ø = average

- a) Decide in the following table whether the particular influencing factor has risen (+), stayed the same (0) or fallen (-).

Period	2021-2025	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050
Ø number of children per woman	—	—	—	—	—	—
Ø male life expectancy	—	—	—	—	—	—
Ø female life expectancy	—	—	—	—	—	—
Ø annual net migration	—	—	—	—	—	—

- b) Select 2020 as the population pyramid year. Study the chart. The light green bars show the number of men of a particular age (the age is specified in the middle), the dark green the number of women. The wider the pyramid at a particular age, the more people there are of this age. How many men aged 80–84 are there in 2020 (move the mouse cursor over the green bar to read the value)? How many women aged 80–84 are there in 2020?

- c) Now set the population pyramid year and the year for the charts on the left to 2050. How many men aged 80–84 do you see now? How many women?

- d) Calculate the difference in the values for 2020 and 2050. Compare this difference with the value in 2020. What do you see?

- e) How does the total population figure change between 2020 and 2050? Calculate the difference between the population figure for 2020 and that for 2050.

- f) Look at the chart on the old-age dependency ratio. How will it change between 2020 and 2050 according to the scenario? Calculate the difference. What does this change mean for pensions?
Bear in mind that the old-age dependency ratio is the ratio of pensioners to people of working age. An old-age dependency ratio of 33 means that one person of working age has to cover 33% of an individual's AHV pension. In this example there are three people of working age for every one female pensioner (see table in Task 1 of Worksheet 1).

2) Enter the values from the following table. Only net migration has changed.

Period	2016-2020	2021-2025	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050
Ø number of children per woman	1.52	1.55	1.55	1.6	1.6	1.6	1,6
Ø male life expectancy	81.5	83.0	84.0	85.0	85.5	86.5	87,0
Ø female life expectancy	85.3	86.0	87.0	87.5	88.0	89.0	89,5
Ø annual net migration	50,799	75,000	75,000	75,000	75,000	75,000	75 000

a) What is the old-age dependency ratio in 2050?
Calculate the difference in the old-age dependency values between 2020 and 2050.

b) Now enter 30,000 as the average annual net migration for every year.
What is the old-age dependency ratio in 2050 now?

c) Now enter 100,000 as the average annual net migration for every year.
What is the old-age dependency ratio in 2050?

d) Compare the population figure in 2050 for question 2c with that for 1e.
Calculate the difference.

e) What impact does higher net migration have on the old-age dependency ratio?

f) How does higher net migration affect pension funding?

g) What impact does higher net migration have on the total population figure?
What effects does this development have?

Optional: Think of your own scenario for future demographic trends and enter these values into the simulation.

3) Compare the data for Finland and Switzerland in the following table.

	Ø number of children per woman	Ø male and female life expectancy	Ø annual net migration (per 1,000 inhabitants)	Old-age dependency ratio
Switzerland 2020	1.46	83.0	6.2	30.3
Finland 2020	1.37	82.0	3.2	36.0

Data: Eurostat and SFSO, 2020

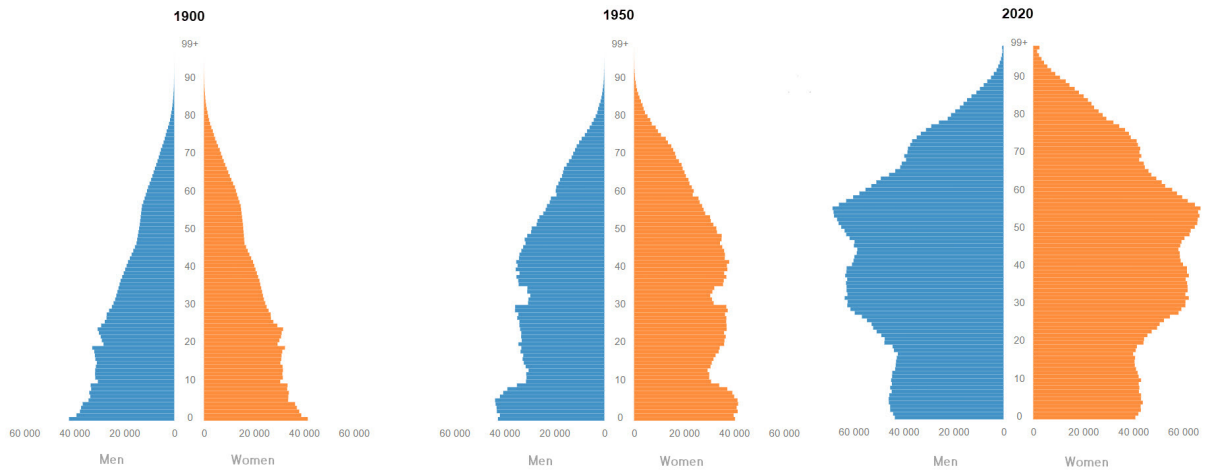
a) What differences do you see?

b) Tick the appropriate boxes.

- In Switzerland about 2.5 people of working age finance one pensioner.
- In Finland about three people of working age finance one pensioner.
- Net migration per 1,000 inhabitants is more than three times higher in Switzerland than in Finland.
- Life expectancy in Switzerland is lower than in Finland.
- Finnish women on average have more children than Swiss women.

4) Look at the population pyramids for Switzerland shown below.

Age structure of the population



Source(s): SFSO – VZ, STATPOP, © SFSO, Neuchâtel 2021

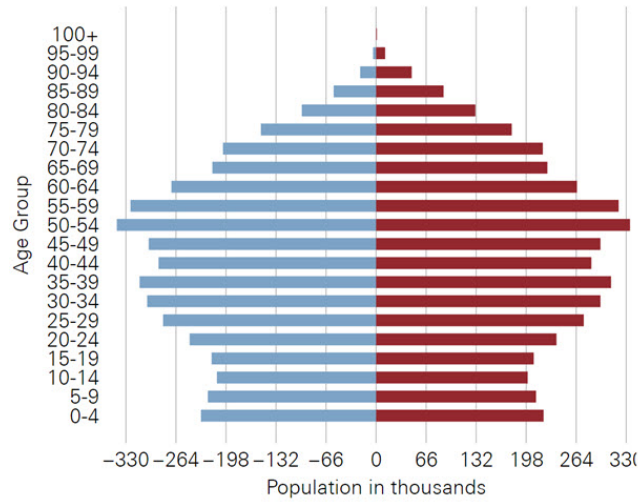
a) Compare the shape of the three pyramids. Which age category is the biggest in each one?

b) What strikes you about the shape of the three pyramids in general?
How is the population distributed over the different age groups?

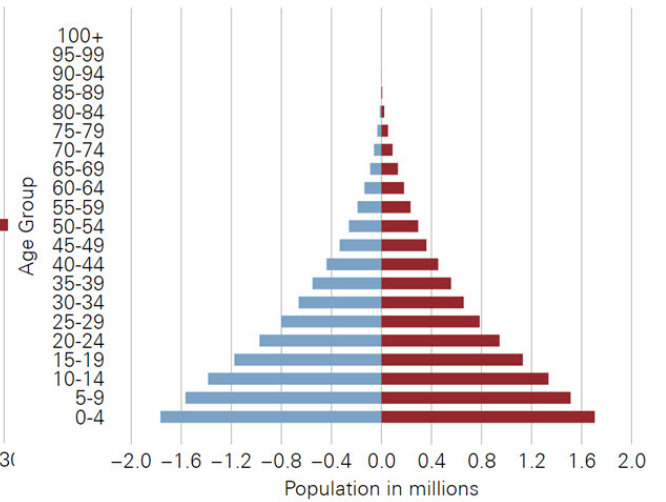
c) How has total population developed?

- 5) Compare the population pyramid of Burkina Faso with that of Switzerland. Burkina Faso is a country in West Africa with a population of approximately 19 million. It is one of the poorest countries in the world. Approximately one third of the populations has to survive on less than USD 1.90 a day.^[2]

POPULATION SWITZERLAND - 2020



POPULATION BURKINA FASO - 2020



Male Female
Quelle: UNO, World Population Prospects 2022

Male Female

- a) Which age category is the largest in each case?

- b) Why does Burkina Faso's pyramid differ so strongly from Switzerland's? Think about the following factors: average number of children per woman, life expectancy, migration.

- 6) Like any model, the Excel simulation of Switzerland's population growth has certain advantages and disadvantages. The following is an excerpt from slide 20 of the presentation on 'Switzerland's ageing population' (Raymon Kohli, Swiss Federal Statistical Office (SFSO)). The excerpt contains a list of the advantages and disadvantages of the Excel simulation compared with the SFSO model used to predict population trends in Switzerland.

Population projection model (5/5)

Advantages and limitations of the model

Advantages:

- Fast calculations (automatic update)
- Easy choice of assumptions (lists of values, rates or corresponding probabilities already calculated)

Limitations:

- Important simplifications (age-specific rates already set)
- Projection by steps of 5 years (no intermediate value can be calculated)
- No differentiation between different groups (e.g. Swiss, foreign nationals)

Put these advantages and disadvantages into context and evaluate the Excel simulation of Switzerland's population growth.

- 7) Any model is a simplified representation of reality. It therefore does not represent the complete world, but a section of it. How large this section is depends on the purpose for which the model is to be used (analogous to a map). By omitting unimportant parts of reality, models bring the represented facts into a manageable form.

Some models, such as the SFSO model, can be used for forecasting purposes. This means that with the help of the SFSO model, statements can be made about the future development of the population. However, the predictive power of even the best population forecasting model is limited. Why? Give arguments.

Footnotes:

^[1] The influencing factors are demographic factors in a country, which have an impact on population development. The four most important are the average number of children per woman (total fertility rate), average life expectancy for men, average life expectancy for women, and average annual net migration.

^[2] Source(s): index mundi